Patent claims

1.   A comb filter arrangement for decimating a
      sequence of digital input values (x_i) into a
5   sequence of digital output values (y_j) by a
      non-integral factor $M + \alpha$, M being a positive
      integer and $0 < \alpha < 1$, with:
      an input-end integrator (10) of the n-th order
      whose output can be fed to at least three signal
10   paths (20, 30, 40);
      each signal path (20, 30, 40) having:
      an adjustable delay stage (22, 32, 42) with delay
      $m \cdot k$ which can be set to different values,
      $m = 1, 2, 3$ and k being a delay factor,
15   a following decimator stage (24, 34, 44) by the
      factor M, where $M = 1, 2, 3, \ldots,$ and
      an output-end differentiator stage (26, 36, 46)
      for generating intermediate output values
      (y_i, y_{i+k}, y_{i+2k}) which are connected to an input of
20   an interpolation arrangement (60) at whose output
      the decimated sequence of digital output values
      (y_j) can be tapped,
      it being possible for the interpolation
      arrangement (60) always to interpolate between two
25   intermediate output signal values
      (y_i, y_{i+k}; y_{i+k}, y_{i+2k}) which have an interval of k/f,
      f being a sampling rate;
      the interpolation arrangement (60) having two
      switch-over devices (62, 64) whose inputs
30   (e1, e2, e3) are each connected to an output of
      the differentiator stages (26, 36, 46) and whose
      outputs (a) are connected to in each case one
      amplifier (70, 72);
      an adder stage (80) for adding the output signals
35   of the two amplifiers (70, 72) at whose output the
      sequence of the decimated digital output values
      (y_j) can be tapped being provided; and

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the first amplifier (70) having a gain factor α and the second amplifier (72) having a gain factor $1-\alpha$.

5   2.   The comb filter arrangement as claimed in claim 1, wherein the interpolation arrangement (60) can carry out a linear interpolation.

3.   The comb filter arrangement as claimed in one of

10   claims 1 or 2, wherein a control device (100) is provided for switching over the switch-over devices (62, 64) in accordance with the two intermediate output values (y_i, y_{i+k}; y_{i+k}, y_{i+2k}) to be interpolated.

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4.   The comb filter arrangement as claimed in one of claims 1 to 3, wherein a control device (100) is provided by means of which the delays $m \cdot k$ of the delay stages (22, 32, 42) can be set.

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5.   The comb filter arrangement as claimed in one of claims 1 to 4, wherein the delays $k \cdot m$ of the individual delay stages (22, 32, 42) are selected with respect to one another so that they differ

25   from one another by an integral multiple.

6.   The comb filter arrangement as claimed in one of claims 1 to 5, wherein $m = n$.

30   7.   The comb filter arrangement as claimed in one of claims 1 to 6, wherein the comb filter arrangement is implemented by means of a microprocessor to which the digital input values (x_i) can be fed as input data, and at whose output the digital output

35   values (y_j) can be tapped.

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